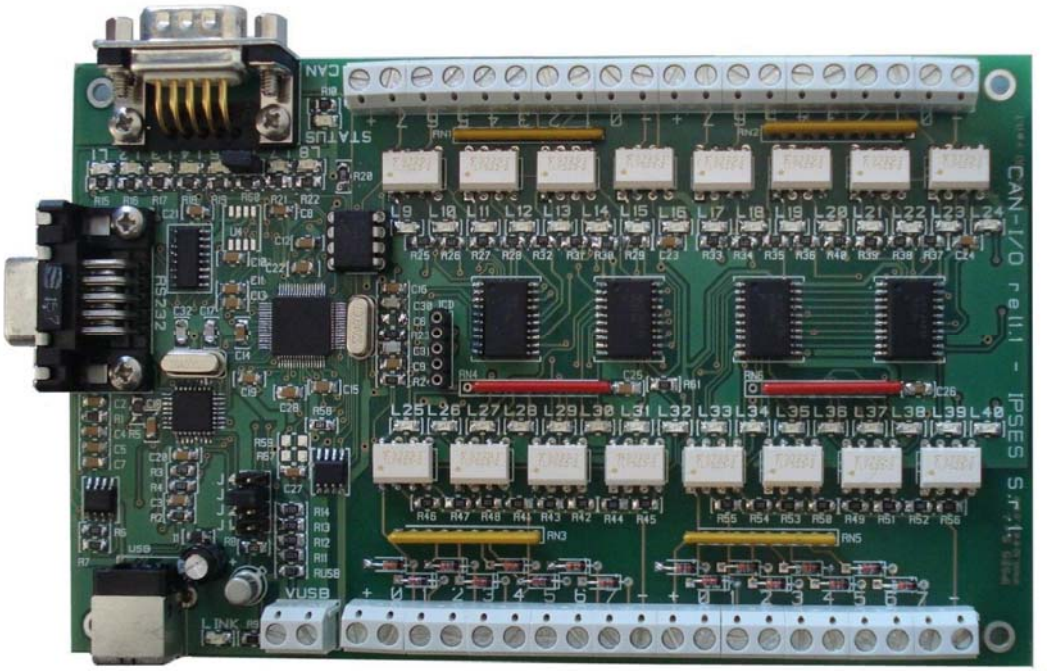
CAN I/O Control Unit
USER MANUAL

Rel. 01.00.0004
(Hardware code: CAN I/O)



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WARNING!
ELECTRICAL DEVICES COULD DAMAGE EQUIPMENT OR PROPERTY OR CAUSE PERSONAL INJURY

This guide contains instructions and technical features of the CAN I/O Control Unit.
Read with attention before attempting to install.
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For any information which is not contained in this guide, please contact:

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REVISION HISTORY

Manual revision history

Revision/ Date	Change description	Author
01.00.0000 January 2009	First version Released	Zancanato A.
01.00.0001 January 2011	Modified driver installation chapter and added new available I/O cards	Zancanato A.
01.00.0002 April 2011	Added chapter with description of communication protocol	Zancanato A.
01.00.0003 April 2014	Minor changes	Mancuso C.
01.00.0004 June 2015	Update document layout	Bottaccioli M.

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GENERAL FEATURES

CAN I/O is a control unit, integrated on European Card Format (160 x 100 mm – 6,30 x 3,94 inches) equipped with CAN, USB and RS232 interfaces.
The card can work as stand alone device on CAN BUS. Its configuration is achieved either through USB (in this case the board is self powered) or through RS232 interface.
CAN I/O can manage sixteen optocoupled inputs and sixteen optocoupled outputs which are reciprocally isolated in two groups of eight.
A driver to for USB is provided with the card. Besides, a configuration software is also provided with: this software allows to control the board either through USB and RS232 and allows to configure CAN working parameters (such as baudrate, high and low speed, etc...).

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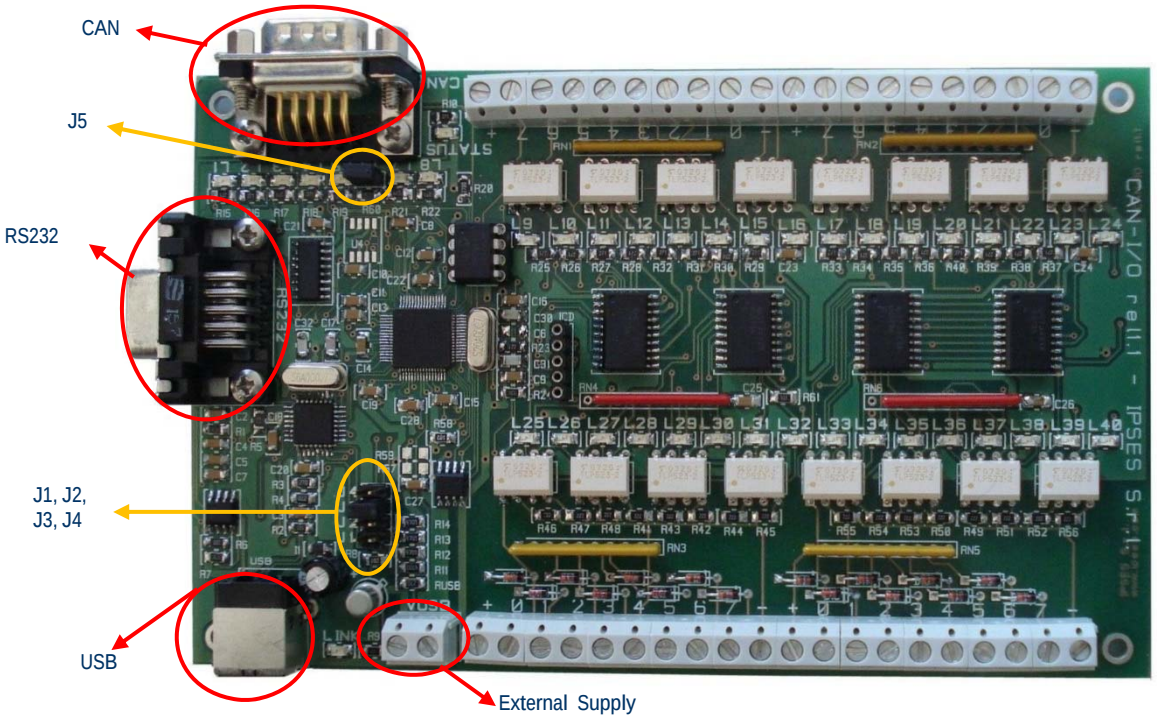
CARD DESCRIPTION

CAN I/O card is shown in the pictures below. In the upper part of the card there are the sixteen outputs which are numbered from 0 up to 7 on the card serigraphy, divided in two groups. In the lower part of the card there are the sixteen inputs, numbered and divided as the outputs. CAN, USB, RS232, external supply connectors and configuration jumpers are also shown

ATTENTION: IN ORDER TO PRECLUDE MALFUNCTIONING OR DAMAGE DO NOT CONNECT EXTERNAL POWER SUPPLY AND USB AT THE SAME TIME



Picture 1a: CAN I/O card, jumper and interfaces

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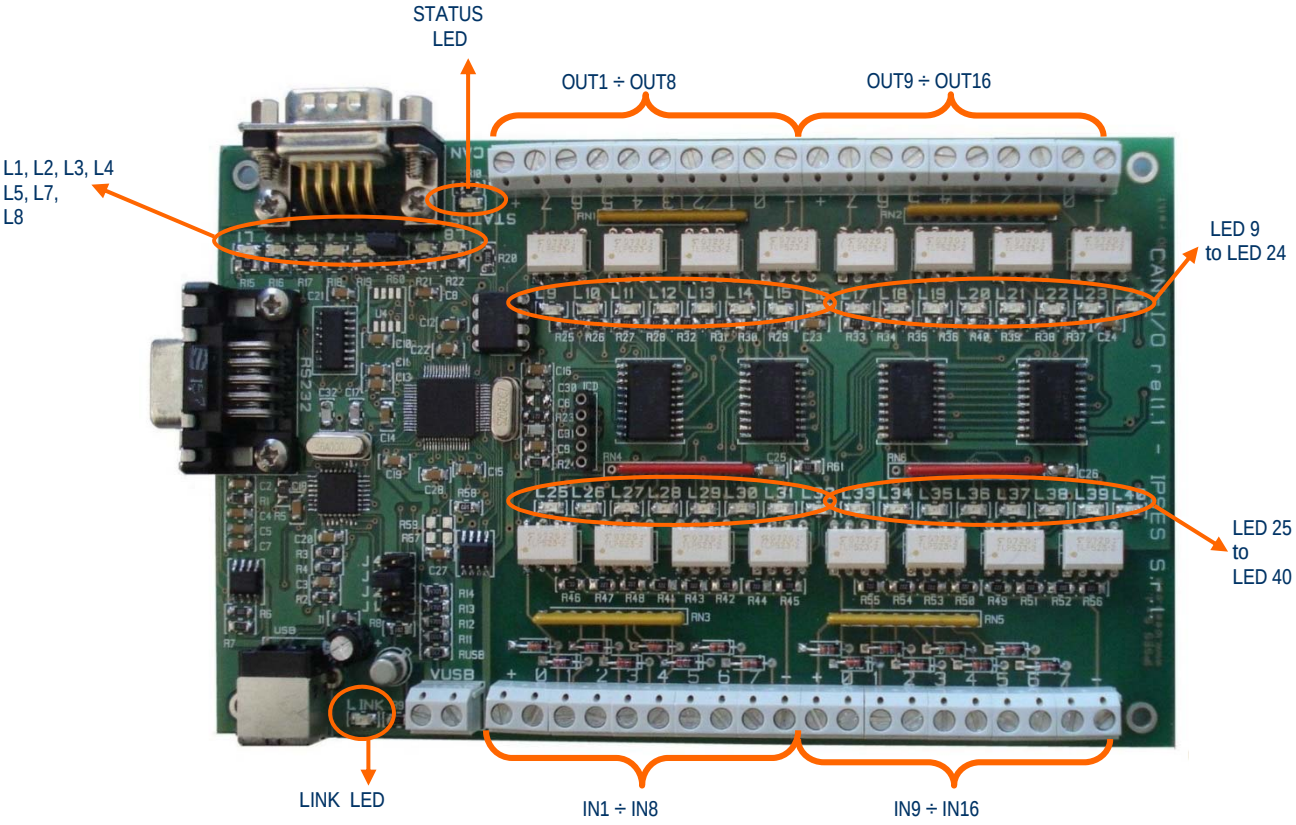

Picture 1b: CAN I/O card, jumper and interfaces

The Jumpers are (Picture 1a):

J1	If inserted before start up, it sets the device in firmware update mode
J2	If inserted, it sets the RS232 communication
J3	Reserved
J4	Reserved
J5	If inserted, it enables the CAN BUS terminate resistor (between CAN-H and CAN-L)

The LEDs are (Picture 1b):

LINK	Green LED: USB has been recognized and can communicate

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STATUS	Green LED: CAN enabled
L1	Red LED: RS232 enabled (if it is off ,USB is enabled)
L2	Red LED: reserved
L3	Red LED: reserved
L4	Red LED: reserved
L5	Red LED: reserved
L7	Red LED: firmware update mode
L8	Red LED: check transceiver CAN
L9	Red LED: OUT 1 enabled
L10	Red LED: OUT 2 enabled
L11	Red LED: OUT 3 enabled
L12	Red LED: OUT 4 enabled
L13	Red LED: OUT 5 enabled
D14	Red LED: OUT 6 enabled
L15	Red LED: OUT 7 enabled
L16	Red LED: OUT 8 enabled
L17	Red LED: OUT 9 enabled
L18	Red LED: OUT 10 enabled
L19	Red LED: OUT 11 enabled
L20	Red LED: OUT 12 enabled
L21	Red LED: OUT 13 enabled
L22	Red LED: OUT 14 enabled
L23	Red LED: OUT 15 enabled
L24	Red LED: OUT 16 enabled
L25	Green LED: V_{high} applied at IN 1
L26	Green LED: V_{high} applied at IN 2
L27	Green LED: V_{high} applied at IN 3
L28	Green LED: V_{high} applied at IN 4
L29	Green LED: V_{high} applied at IN 5
L30	Green LED: V_{high} applied at IN 6
L31	Green LED: V_{high} applied at IN 7
L32	Green LED: V_{high} applied at IN 8
L33	Green LED: V_{high} applied at IN 9
L34	Green LED: V_{high} applied at IN 10
L35	Green LED: V_{high} applied at IN 11
L36	Green LED: V_{high} applied at IN 12
L37	Green LED: V_{high} applied at IN 13
L38	Green LED: V_{high} applied at IN 14
L39	Green LED: V_{high} applied at IN 15
L40	Green LED: V_{high} applied at IN 16

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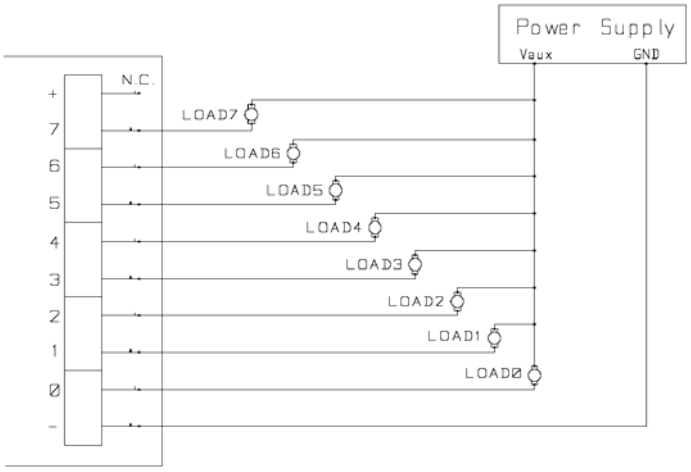
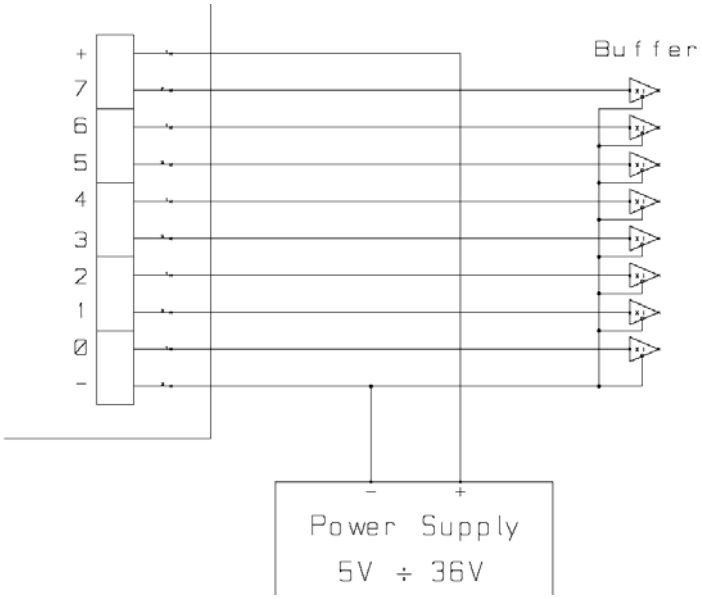
OUTPUT

The sixteen outputs are completely isolated both between them in two groups of eight and with other signals on the device. Here below there are the diagrams of two typical connections of external device to CAN I/O card: in the first case, the card will manage directly some loads (with maximal current of 150mA). In the second case, the card is connected to a high impedance device (i. e. the inputs of a PLC).



Picture 2a: diagram of the output connections.



Picture 2b: diagram of the output connections.

Output status is displayed by LED placed near every connector (LED from L9 to L24).

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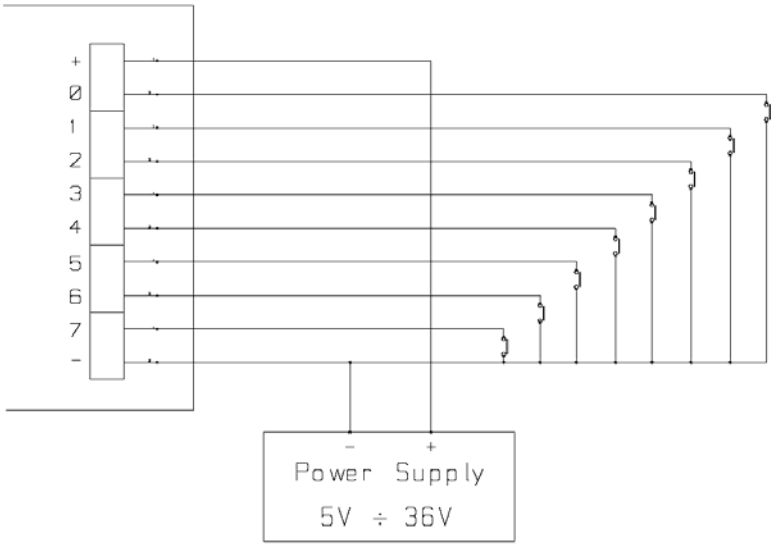
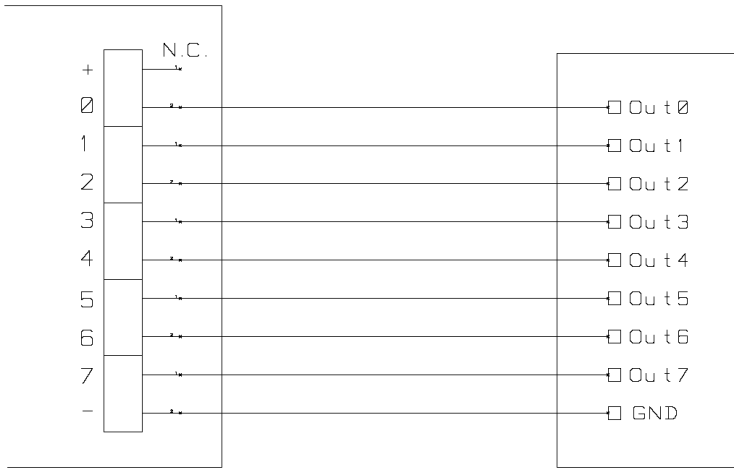
INPUT

The sixteen inputs are completely isolated both between them in two groups of eight and toward other signals on the device.
We suggest to connect inputs following one of the two diagrams displayed below:
-picture 3a: in case inputs have to detect the pression of a switch or an open collector output.
-picture 3b: in case inputs are directly controlled by a voltage.



Picture 3a: diagram of input implementation.



Picture 3b: diagram of input implementation.

Input status is displayed by LEDs placed near every connector (LED form L25 to L40).

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STATUS LEDS

LED STATUS	Status description
OFF	CAN in SLEEP mode
ON	CAN enabled

LED L8	Status description
OFF	Device ready for the use
BLINKING	transceiver CAN check-up
ON	transceiver CAN lacking or damaged

DRIVER INSTALLATION

We recommend to execute the automatic software installation from CD before connect the device to PC. By this way software and USB driver for CAN I/O are installed, allowing the PC to automatically identify the device once you connect it.
If you use the recommend automatic software installation from CD , do not follow all the others indications contained in this chapter.

If you DO NOT install the software CAN Manager and you use the card CAN I/O you need to install only the USB IPSES driver that is certified for the most recent Microsoft operating systems:

- Microsoft Windows 2000 family
- Microsoft Windows XP family, x86
- Microsoft Windows Server 2003 family, x86
- Microsoft Windows Server 2003 family, x64
- Microsoft Windows XP family, x64
- Microsoft Windows Vista family, x86
- Microsoft Windows Vista family, x64
- Windows Server 2008 family, x86
- Windows Server 2008 family, x64

–Windows 7

- Windows 7 x64
- Windows Server 2008 Release 2 family, x64

If your PC has an internet connection, you should follow the automatic Windows Update procedure, otherwise follow the manual installation procedure from CD.

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Automatic Windows Update procedure

1) Connect the CAN I/O to PC using a USB cable. *Windows* operating system will detect a new device, showing a message similar to:

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

2) In the following windows “found new hardware wizard” chose “Yes, this time only” and then “Next”.

Found New Hardware Wizard
This wizard helps you install software for:
CAN Logger
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

3) Then choose “install the software automatically (Recommended)” and then “Next”. Wait for downloading of the driver and its installation.

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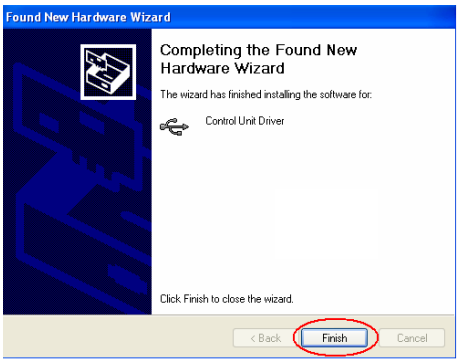
4) Installation is displayed. Choose



completed when the window on the left is "Finish" to exit.

5) After a window with the message "Found New Hardware. USB Serial Port" is displayed. Follow again instruction from point 2)

Manual driver installation procedure

1) Connect the CAN I/O to PC using a USB cable. *Windows* operating system will detect a new device, showing a message similar to:

2) In the following windows "found new hardware wizard" chose "No, not this time" and then "Next".

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Found New Hardware Wizard
This wizard helps you install software for:
CAN Logger
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

3) Then choose "install from a list or specific location (Advanced)" and "Next". Then Set the driver folder path on the CD provided with.

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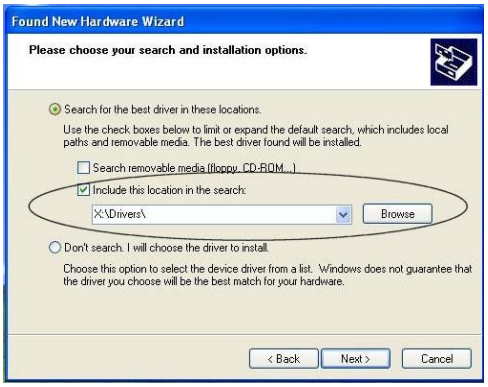
Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
X:\Drivers\
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

4) The Successful of the installation is indicated by the message of completing the found new hardware wizard. To end, click "Finish".

Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
Libra (by IPSES S.r.l.)
Click Finish to close the wizard.
< Back
Finish
Cancel

5) After installation of the hardware described above, the new device "USB Serial Port" is detected. Follow again instruction from point 2).

SOFTWARE

A CD with a demo software is provided with the card. This software allows to manage CAN I/O main functions.

Main window description

In the picture below there is a *snapshot* of the software main window.

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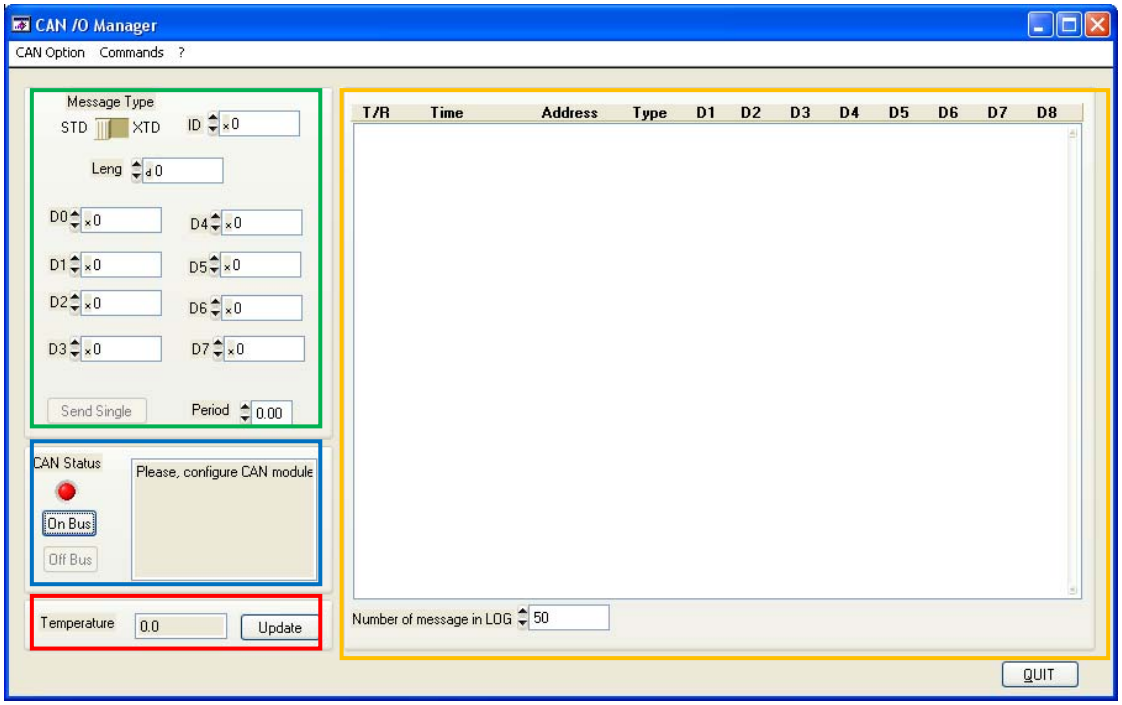

Picture 4: Main windows of the software.

The main windows is divided in four zone which, in the picture above, are surrounded respectively in blue, yellow, green and red.

The blue surrounded zone includes commands to enable or to disable CAN interface using the available button. When CAN interface is enabled, the CAN Status LED turns green and CAN settings are shown

If CAN interface is enabled, the device executes a BUS scan. CAN messages appear in the yellow surrounded zone. The number of messages shown in the text box can be changed using the *indicator number* which is in the lower part of the window. The CAN log can be saved as ASCII file choosing *Save CAN log* from *CAN Option* menu.

The device can send messages in the following modes all customizable by the user: standard or extended, single or periodic.
The green surrounded zone allows the user to insert: CAN address, message length and data to be sent. To send a single message, set the period at zero; in case of periodic messages, set the period value.
We suggest to disable the *show sent message* function from *CAN Option* menu if you send periodic messages, because in this case the software becomes slow.

The device is also equipped with a temperature sensor. Push the button in the red surrounded zone to read the board measured temperature.

Config Panel description
Before using CAN interface, the device must be configured. The configuration is made through the Config panel (Picture 5). To enable it, select *Config CAN* from *CAN Option* menu.

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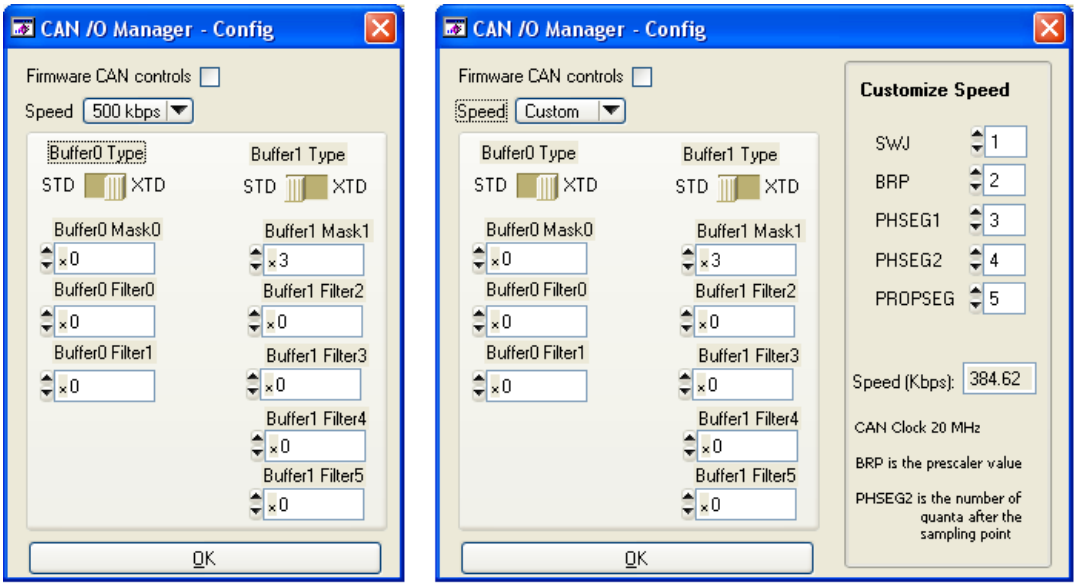


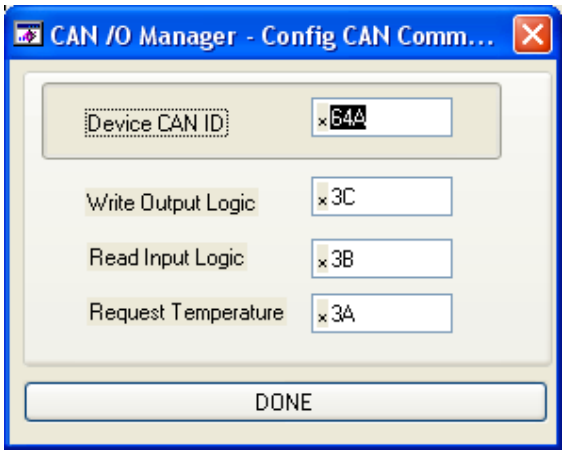
Picture 5: Config Panel.

Configuration panel allows to set: speed (the user can change manually the registers or he can choose a pre-calculate speed), mask, filters and activation of CAN Commands.

Description of Command Configuration Window

The *CAN Command Windows* allows to set card address and *CAN Commands*.
The *CAN Commands* are: *read input*, *write output*, *read temperature*. Thanks to these commands it is possible to communicate through CAN.
To configure CAN commands, it is necessary to assign an address to CAN I/O and to configure command data (the first bytes of CAN messages).
Default configuration is 500 kbps speed with no filters.

The Command Configuration Window (Picture 6) can be opened from *Command* menu choosing *Config CAN Command*.



Picture 6: Command Configuration Window

Default configuration is 500 Kbps speed with the following parameters:

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ADDRESS: . . . . . .64A *(hex)*
READ TEMPERATURE COMMAND: . . . . . 3A *(hex)*
READ INPUT COMMAND: . . . . . 3B *(hex)*
WRITE OUTPUT COMMAND: . . . . . 3C *(hex)*

CAN Command Description
CAN message to write CAN I/O Output must contain:
1 - CAN I/O address (defined by users)
2 – the first byte which is the *write output command* (defined by users)
3 – the second byte which is the output state (from 1 up to 8)
4 – the third byte which is the output state (from 9 up to 16)

OTHER BYTES WILL BE IGNORED

Example (ref. Picture 6):
CAN message to enable the fourth and the eleventh output are:

Direction	Address	Byte 1	Byte 2	Byte 3	Other Byte
IN	5D8(hex)	1(hex)	8(hex)	4(hex)	IGNORE
OUT	5D8(hex)	41(hex)	8(hex)	4(hex)	Not present

CAN message to get CAN I/O input state must contain:
1 - CAN I/O address (defined by users)
2 – The first byte which is the *read input command* (defined by users)

OTHER BYTES WILL BE IGNORED

Example (ref. Picture 6):
CAN message to read the CAN I/O input state. The reply shows the fourth and eleventh inputs are high.

Direction	Address	Byte 1	Byte 2	Byte 3	Other Byte
IN	5D8(hex)	2(hex)	IGNORE	IGNORE	IGNORE
OUT	5D8(hex)	42(hex)	8(hex)	4(hex)	Not present

CAN message to get board measured temperature must contain:
1 - CAN I/O address (defined by users)
2 – The first byte which is the read *temperature command* (defined by users)

OTHER BYTES WILL BE IGNORED

Example (ref. Picture 6):
CAN message to read temperature: the reply shows a temperature of 21.19°C calculate as follows:

153(hex)*0.0625(dec)°C=21.1875°C

Direction	Address	Byte 1	Byte 2	Byte 3	Other Byte
IN	5D8(hex)	3(hex)	IGNORE	IGNORE	IGNORE

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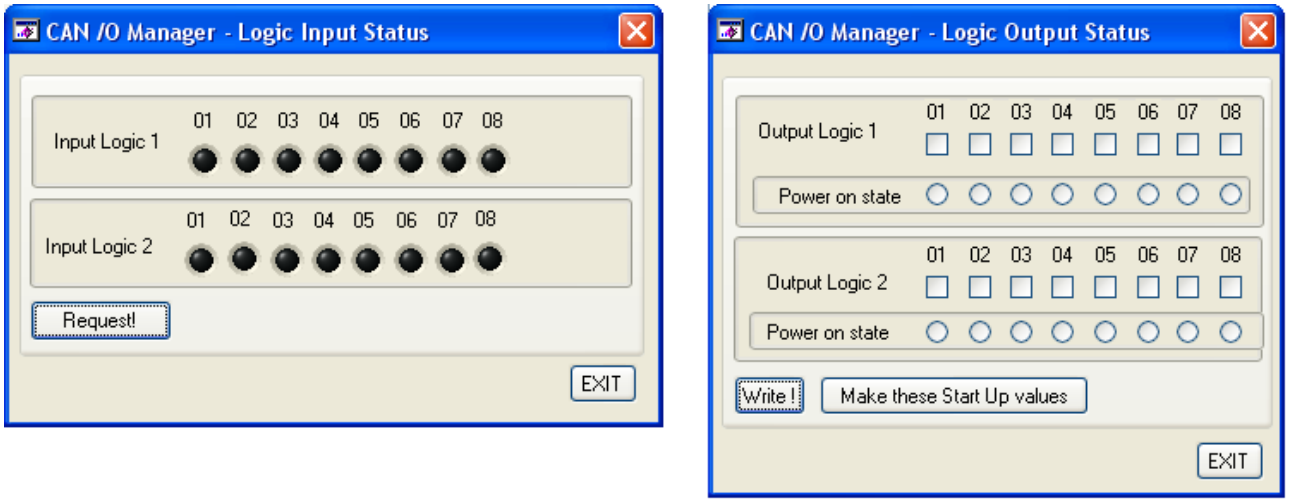
OUT	5D8(hex)	43(hex)	1(hex)	53(hex)	Not present

Check inputs and outputs using software

Through software it is possible to read input status or to write the output status using the relevant window (Picture 7) which can be opened choosing *Read Input Logic* or *Write Output Logic* from *Command* menu.


CAN /O Manager - Logic Input Status
Input Logic 1
01 02 03 04 05 06 07 08
Input Logic 2
01 02 03 04 05 06 07 08
Request!
EXIT
CAN /O Manager - Logic Output Status
Output Logic 1
01 02 03 04 05 06 07 08
Power on state
Output Logic 2
01 02 03 04 05 06 07 08
Power on state
Write !
Make these Start Up values
EXIT

Picture 7: Logic Input/Output Windows.

Trhough Logic Output Status windows it is possible to configure CAN I/O output start up status. To do this, write the values and then push *Make these Start Up values* button, the start up output values are shown under the check box.

Stand Alone Mode

CAN I/O can work on a CAN BUS with no PC and software. To enable the stand alone mode it is enough to connect CAN interface and power supply the card either from USB or from an external power supply.
(ATTENTION: IN ORDER TO PRECLUDE MALFUNCTIONING OR DAMAGE DO NOT CONNECT EXTERNAL POWER SUPPLY AND USB AT THE SAME TIME).

Default configuration is 500 Kbps speed with the following parameters:

ADDRESS: . . . . . .64A *(hex)*
READ TEMPERATURE COMMAND: . . . . . 3A *(hex)*
READ INPUT COMMAND: . . . . . 3B *(hex)*
WRITE OUTPUT COMMAND: . . . . . 3C *(hex)*

CAN default configuration can be modified and saved when you exit form the software. The device reloads the parameters automatically at the start up.

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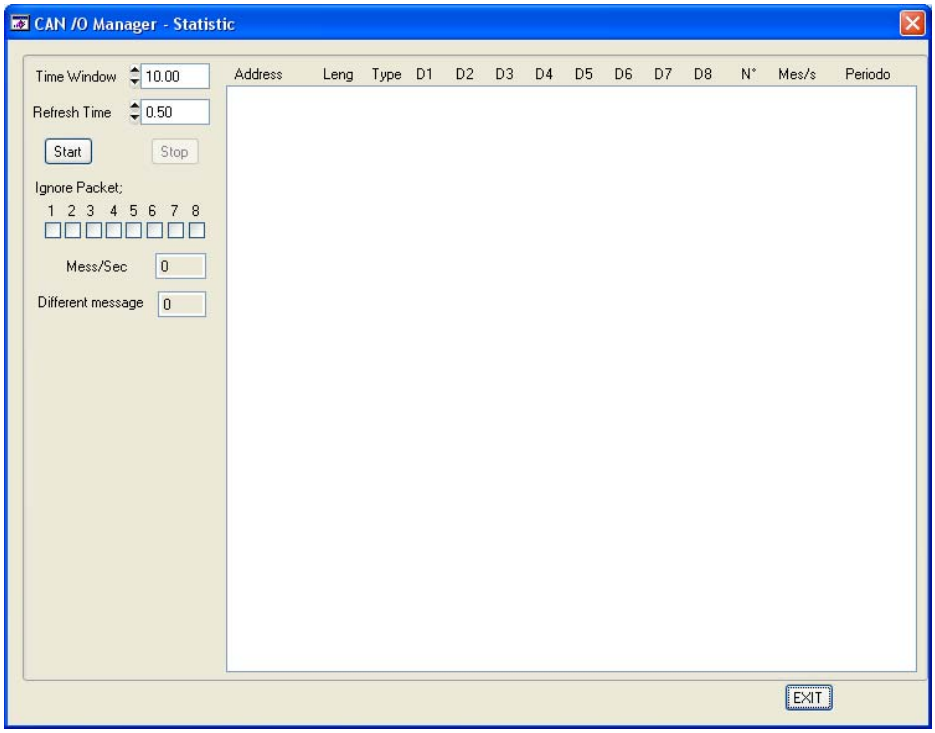
Statistic Window Description

The software can find the period of different CAN messages on the BUS. This feature is available in *CAN Option* menu when CAN interface is enabled.



Picture 7: Statistic Window.

The user can customize the watching time window, the refresh period and he can filter one or more bytes from the CAN message.

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COMMUNICATION PROTOCOL

Is possible to use some features of the board through a direct communication with RS232 or USB interfaces.
If you want use the USB interface you need to install the driver supply with the board and include the dynamic library FTD2XX.dll.
Otherwise, if you use the RS232 interface, no drivers installation is required.

ATTENTION: IN ORDER TO PRECLUDE MALFUNCTIONING OR DAMAGE DO NOT CONNECT EXTERNAL POWER SUPPLY AND USB AT THE SAME TIME

Every command sent to the board must be formatted in the following way:

<FRMDELM> <CMD> <Data> <FRMDELM>

Where <FRMDELM> is the byte that delimit the command frame "0x20", <CMD> is the byte that identify the command and <Data> are the command parameters.
The board response format is:

<CMD> <Data>

Where <CMD> is the command executed and <Data> are the requested parameters.
The available commands are:

- The output write command (<CMD>=0x51) followed by two byte which bits represent the 16 outputs status.
  The board respond only <CMD> byte
  Example: *command:* *0x20 0x51 0x81 0x18 0x20*
  reply: *0x51*
  effect: *the outputs 0, 7 of the first block and the outputs 3, 4 of the second block are now active.*

- The command that set the current output status as start-up status (<CMD>=0x48).
  The board respond only <CMD> byte
  Example: *command:* *0x20 048 0x20*
  reply: *0x48*
  status: *The current output status is set as Start-Up status*

- The read input command (<CMD>=0x52).
  The board respond with <CMD> byte followed by two byte which bits represent the 16 inputs status.
  Example: *command:* *0x20 0x52 0x20*
  reply: *0x52 0x81 0x18*
  status: *the inputs 0, 7 of the first block and the inputs 3, 4 of the second block are active*

- The read temperature command (<CMD>=0x50.
  The board respond with <CMD> byte followed by two byte that represent a 16 bit integer number. You can find the temperature multiply this number for 0.0625.
  Example: *command:* *0x20 0x50 0x20*
  reply: *0x50 0x01 0x93*
  interpretation: *The 16 bit number is -> 0x0193=403*
  *the temperature is 403**0.0625=25.19°C

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FTD2XX.dll USAGE EXAMPLE

This example show the usage of the USB dynamic library FTD2XX.dll for a direct board communication. The example was write in C but you can use this library with any program language.

```
/*****************************************************************************/
// Open Device Communication
/*****************************************************************************/
		if ((*FT_Open_Ptr) (0, &Handle_device))
		{
			MessagePopup ("ERROR",OPEN_ERROR_MSG );
			goto Error;
		}

/*****************************************************************************/
// Read temperature
/*****************************************************************************/
		//send command
		buffer=malloc(3);
		buffer[0]=FRAME;
		buffer[1]=CMD_READ_TEMPERATURE;
		buffer[2]=FRAME;

		if ((*FT_Write_Ptr) (Handle_device, buffer, 3, &ByteWrite))
		{
			MessagePopup ("ERROR",WRITE_ERROR_MSG );
			free(buffer);
			goto Error;
		}
		//read answer
		if ((*FT_Read_Ptr) (Handle_device, buffer, 3, &ByteRead))
		{
			MessagePopup ("ERROR",READ_ERROR_MSG );
			free(buffer);
			goto Error;
		}
		if (*buffer!=CMD_READ_TEMPERATURE)
		{
			MessagePopup ("ERROR",READ_ERROR_MSG );
			free(buffer);
			goto Error;
		}
		temperature = ((buffer[1]<<8)+buffer[2])*0.0625;
		free(buffer);
		buffer=malloc(50);
		sprintf (buffer, "Temperature: %f", temperature);
		MessagePopup ("ERROR", buffer);
		free(buffer);
```


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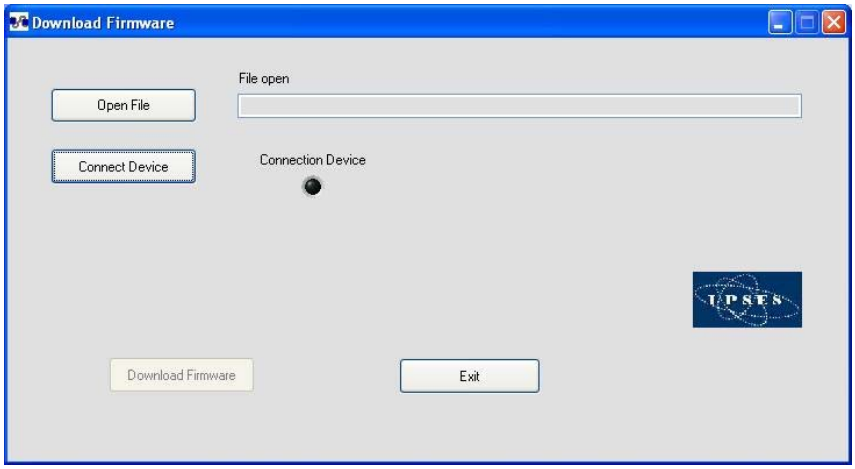
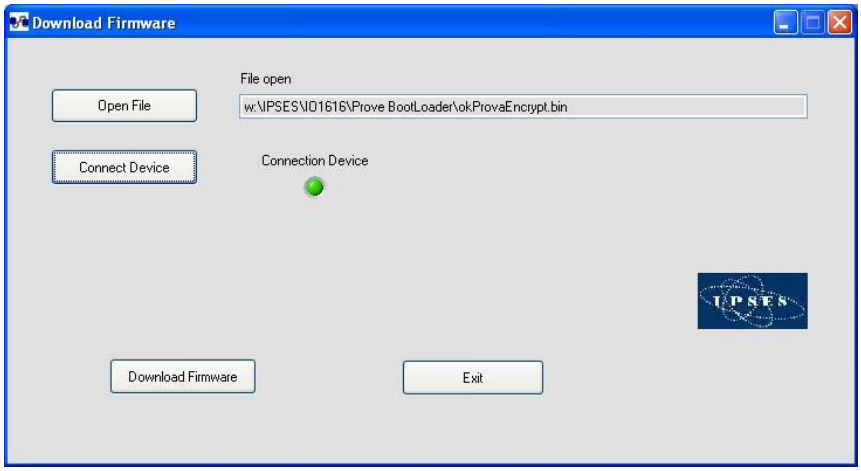
FIRMWARE UPGRADE FUNCTIONALITY

CAN I/O is provided with a Boot Loading for firmware update by USB. To set the unit in firmware upgrade mode, select jumper J1 before switching on the device. To do firmware Upgrade a specific software shown in figure 9 must be used. Firmware upgrading is not possible through RS232 or CAN.



Picture 8: Firmware upgrade software start-up.

Open the new firmware file pushing *Open File* button, then activate connection choosing *Connect Device* button (if the connection is disabled the LED stays off), then push *Download Firmware* and wait for the pop-up message (fail or pass).



Picture 10: file loaded.

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PRODUCT CODE

Code	Description
CAN I/O	CAN I/O control card
CAN I/O-DIN	CAN I/O control card mounted on a universal support for DIN rail
USB-A-B	USB cable to connect USB cards
USB-A-B-ill	USB cable with light end to connect USB cards

TECHNICAL FEATURES

Power supply: USB configuration mode: self powered through USB
Stand alone mode: 5V external supply or self powered through USB RS232 configuration mode: 5V external supply

Working temperature: from 0°C up to +60°C

Storage temperature: from -40°C up to +85°C

Interface toward: 1 USB port type B, compatible with USB2.0 and RS232

Card dimensions: 160 x 100 mm (6.30 x 3.94 inches)

Inputs: sixteen optocoupled inputs, reciprocally isolated in two groups of eight, which
can support a max voltage of 36V
low level: lower then 1V
high level: higher then 2,5V
impedance: about 2,5 kΩ

Outputs: sixteen optocoupled outputs, reciprocally isolated in two groups of eight, which can support a max voltage of 36V and max current of 150mA.

CAN: configurable High-speed o Low-speed with customize band rate (up to 1MB/s) and support for extended or standard frame.

Protection: optocouplers with operative isolation voltage of 2.500 max RMS

Thermal sensor:
Resolution: 0,0625°C
Accuracy: ±1°C (max) from 25°C to 65°C
±2°C (max) from -40°C to 25°C and from 65°C to 85°C
±3°C (max) from -55°C to -40°C and from 85°C to 125°C

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OTHER AVAILABLE I/O CARDS

IO-69: Input/output Card with 6 inputs and 9 relay outputs and USB interface

IO-69-USB is a self-powered card to manage six optocoupled inputs and nine relay outputs with USB interface.

A timeout control allows to protect the connecting devices, turning off all the outputs if it does not receive commands from the host within a time configurable through software.

Furthermore, there is the possibility to program all the outputs so that each one will activate only when inputs reach assigned conditions: in this case, **IO- 69** acts like a programmable logic controller (PLC).

The card is produced in two versions: with single pole double throw relay (SPDT) and with single pole single throw relay (SPST).

General technical features:
Power supply: selfpowered thorugh USB
Working temperature: from 0°C up to + 60°C
Storage temperature: from -40°C up to + 85°C
Size: European format card (100 x 160 mm - 3,94 x 6,30 inches)

USB port technical features:
1 type B port, compatible with USB 2.0, autonomously powered for the host connection

Possibility to connect directly to an host port up to 256 cards for a maximum of 1.536 inputs and 2.304 outputs.

Technical features of inputs:
Number of inputs: six
Operative Voltage: independently selectable for each input at 5V/12V/24V (DC)
Protection: optocouplers with 2.500V_{RMS} maximum operative voltage
Connectors: pitch terminal block

Technical features of outputs:
Number of outputs: nine
SPDT version:
- Type: relay single pole double throw
- Max switching current: 0,25A
- Max carrying current: 0,5A
- Max switching voltage: 70V_{AC}/100V_{DC}, potential free
- Max contact resistance: 200mΩ

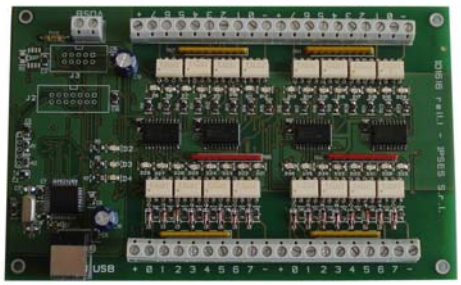
SPST version:
- Type: relay single pole single throw
- Max switching current: 0,5A
- Max carrying current: 1A
- Max switching voltage: 100$V_{AC/DC}$, potential free
- Max contact resistance: 150mΩ

Isolation voltage between coil and contacts: 500V_{DC}.

Connectors: pitch terminal block

Timeout control to turn off all the outputs if it does not receive commands from the host within a time configurable through software.

IO-1616: Input/output Card with 16 inputs and 16 outputs and USB interface



IO1616 is a self powered card to manage sixteen optoisolated inputs and sixteen optoisolated outputs with USB interface.

IO1616 can be directly connected to PLC, to input devices from operator and to other I/O systems.

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	On request, an integrated temperature sensor allows to know in real time the temperature of the system IO1616 is placed in.
General technical features: **Power supply**: self-powered thorugh USB **Working temperature**: from 0°C up to + 60°C **Storage temperature**: from -40°C up to + 85°C **Size**: European format card (100 x 160 mm - 3,94 x 6,30 inches) **USB port technical features:** 1 type B port, compatible with USB 2.0, autonomously powered for the host connection - Possibility to connect directly to an host port up to 128 cards, cards for a maximum of 2.048 inputs and 2.048 outputs **Temperature sensor technical features:** Resolution: 0,0625°C Accuracy: from ±1°C to ±3°C, depending on temperature range. Timeout control to turn off all the outputs if it does not receive commands from the host within a time configurable through software.	**Technical features of inputs:** Number of inputs: sixteen Operative voltage: from 3,3V_{DC} up to 36V_{DC} Max current absorbed: 10mA (on each input) Input impedance: ≈ 2.5KΩ Logic low level: < 1V Logic high level: > 2.5V Port read average time execution: 15 ms Protection: optocouplers with 2.500V_{RMS} maximum operative voltage Connectors: pitch terminal block **Technical features of outputs:** Number of outputs: sixteen Operative voltage: from 3,3V_{DC} up to 36V_{DC} Maximum current: 150 mA Protection: optocouplers with 2.500V_{RMS} maximum operative voltage Connectors: pitch terminal block

WEB-IO-WiFi: Input/output Card with 16 inputs and 16 outputs, Ethernet and WiFi interfaces, integrated web, telnet and SNMP *servers*

WEB-IO-WiFi is a card to manage sixteen optocoupled inputs and sixteen optocoupled outputs with Ethernet and WiFi interfaces, equipped with a web, a telnet and an SNMP servers. The web server allows to connect and to manage the card using any web browser (i. e. Internet Explorer or Firefox), with no needs to install a software on your PC. Beside, the card can be connected directly to a switch or to a router, by this way it can be accessed by any PC connected to Internet. It is also possible to develop a customized software managed by telnet service or SNMP client. The board is available with built-in antenna or with ultra miniature coaxial (U.FL) connector for external antenna connection.

WEB-IO-WiFi can be directly connected to PLC, to input devices from operator and to other I/O systems. Each input and output status can be read by a web browser or a telnet client at any moment, besides it is shown directly on the board thanks to LEDs fixed on. On request, the card can be equipped with an integrated **temperature sensor** which allows to monitor in real time the temperature around the regulator voltage module.

General technical features: **Power supply**: external, from 5V_{DC} to 32V_{DC} **Working temperature**: from 0°C u to + 60°C **Storage temperature**: from -40°C up to + 85°C **Size**: European format card (100 x 160 mm - 3,94 x 6,30 inches) **Max thickness**: 20 mm **Ethernet interface**: 1 Ethernet RJ45 port **Supported protocols:** **Telnet**: the card can work as telnet server **HTTP**: the card can work as web server **SNMP**: the card can work as SNMP server	**Technical features of inputs:** Number of inputs: sixteen Operative voltage: from 3,3V_{DC} to 36V_{DC} Max absorbed current: 10mA (on each input) Logic low level: < 1V Logic high level: > 2.5V Input impedance: ≈ 2.5KΩ Protection: optocouplers with 2.500V_{RMS} maximum operative voltage Connectors: pitch terminal block **Technical features of outputs:** Number of outputs: sixteen

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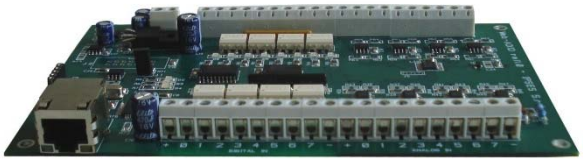
WiFi technical features: - Compatibility: WiFi 802.11b (2,4GHz). - Security: WEP, WPA and WPA2. - Transmit power: 10dBm (10mW). - Receiver sensitivity: -83dBm -Built-in antenna or *ultra miniature coaxial* (U.FL) connector for external antenna connection - Configurable to connect to any Access Point, with any channel and SSID.	Operative voltage: from 3,3V_{DC} to 36V_{DC} Max open collector current: 150mA Protection: optocouplers with 2.500V_{RMS} maximum operative voltage Connectors: pitch terminal block **Temperature sensor technical features:** Resolution: 0,0625°C Accuracy: from ±1°C to ±3°C, depending on temperature range. Timeout control to turn off all the outputs if it does not receive commands from the host within a time configurable through software.

WEB-ADIO: *Input/output Card with 8 analogical inputs, 8 digital inputs, 8 analogical outputs and 8 digital outputs, Ethernet interface, integrated web, telnet* and SNMP *servers*



WEB-ADIO is a card to manage 8 optocoupled digital inputs, 8 analogical inputs, 8 optocoupled digital outputs and 8 analogical outputs with Ethernet interface, equipped with a web, a telnet and an SNMP servers. The WEB server allows to connect and to manage the card using any web browser (i. e. Internet Explorer and Firefox), with no needs to install a software on your PC Beside, the card can be connected directly to a switch or to a router with no need to use a PC.

It is also possible to develop a customized software managed by telnet service.

WEB-ADIO can be directly connected to PLC or to analogical transducer, to input devices from operator and to other I/O systems.

The analogical inputs and outputs have an operative voltage from 0V to 10V, with a resolution of 10mV and are calibrated one by one. Each input and output status can be read by a web browser or a telnet client at any moment, besides, the status of digital inputs and outputs it is shown directly on the board thanks to LEDs fixed on. On request, the card can be equipped with an integrated temperature sensor which allows to monitor in real time the temperature around the regulator voltage module.

General technical features: **Power supply**: external, from 12V_{DC} to 15V_{DC} **Working temperature**: from 0°C up to + 60°C **Storage temperature**: from -40°C up to + 85°C **Size**: European format card (100 x 160 mm - 3,94 x 6,30 inches) **Max thickness**: 20mm **Ethernet interface**: 1 Ethernet RJ45 port **Supported protocols:** **Telnet**: the card can work as telnet server **HTTP**: the card can work as web server **SNMP**: the card can work as SNMP server **Temperature sensor technical features:** Resolution: 0,0625°C Accuracy: from ±1°C to ±3°C, depending on temperature range. Timeout control to turn off all the digital outputs if it does not receive commands from the host within a time configurable through software.	**Technical features of inputs:** Number of inputs: sixteen: 8 analogical and 8 digital Operative voltage of digital inputs: from 3,3V_{DC} to 36V_{DC} Operative voltage of analogical inputs: from 0V to 10V (10 bit ADC). Max current absorbed on each input: Digital: 10mA. Analogical: 1mA. Input impedance: Digital: ≈2,5kΩ. Analogical: ≈15kΩ. Logic low level: < 1V Logic high level: > 2.5V Protection: Digital: optocouplers with 2.500V_{RMS} maximum operative voltage. Analogical: overvoltage protection through calmp diodes. Connectors: pitch terminal block **Technical features of outputs:** Number of outputs: sixteen: 8 analogical and 8 digital Operative voltage of digital outputs: from 3,3V to 36V (DC). Operative voltage of analogical outputs: from 0V to 10V (10 bit DAC). Max current (on each output): Digital: 150mA. Analogical: ± 25mA. Response average time: Digital: 100µs. Analogical: 6ms (from 10% to 90% of the whole dynamic). Protection of digital outputs: optocouplers with 2.500V_{RMS} maximum operative voltage. Connectors: pitch terminal block

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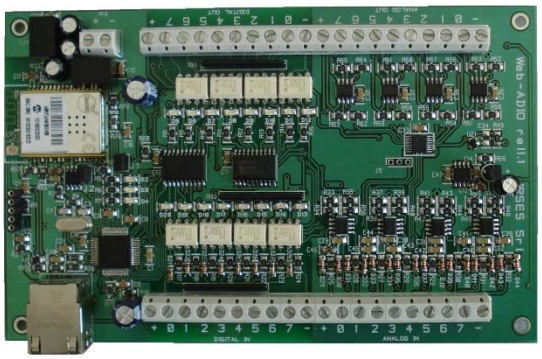
WEB-ADIO-WiFi: Input/output Card with 8 analogical inputs, 8 digital inputs, 8 analogical outputs and 8 digital outputs, Ethernet and WiFi interfaces, integrated web, telnet and *SNMP servers*



WEB-ADIO-WiFi is a card to manage 8 optocoupled digital inputs, 8 analogical inputs, 8 optocoupled digital outputs and 8 analogical outputs with Ethernet and WiFi interfaces, equipped with a web, a telnet and an SNMP servers. The web server allows to connect and to manage the card using any web browser (i. e. Internet Explorer and Firefox), with no needs to install a software on your PC Beside, the card can be connected directly to a switch or to a router with no need to use a PC. The board is available with built-in antenna or with ultra miniature coaxial (U.FL) connector for external antenna connection.

It is also possible to develop a customized software managed by telnet service.

The analogical inputs and outputs have an operative voltage from 0V to 10V, with a resolution of 10mV and are calibrated one by one.

WEB-ADIO-WiFi can be directly connected to PLC or to analogical transducer, to input devices from operator and to other I/O systems. Each input and output status can be read by a WEB browser or a telnet client at any moment, besides, the status of digital inputs and outputs it is shown directly on the board thanks to LEDs fixed on.

General technical features:

Power supply: external, from $15V_{DC}$ to $32V_{DC}$
Working temperature: from 0°C up to + 60°C
Storage temperature: from -40°C up to + 85°C
Size: European format card (100 x 160 mm - 3,94 x 6,30 inches)
Max thickness: 20mm
Ethernet interface: 1 Ethernet RJ45 port

Supported protocols:
Telnet: the card can work as telnet server
HTTP: the card can work as web server
SNMP: the card can work as SNMP server

WiFi technical features:
- Compatibility: WiFi 802.11b (2,4GHz).
- Security: WEP, WPA and WPA2.
- Transmit power: 10dBm (10mW).
- Receiver sensitivity: -83dBm
-Built-in antenna or *ultra miniature coaxial* (U.FL) connector for external antenna connection
- Configurable to connect to any Access Point, with any channel and SSID.

Timeout control to turn off all the digital outputs if it does not receive commands from the host within a time configurable through software.

Technical features of inputs:
Number of inputs: sixteen: 8 analogical and 8 digital
Operative voltage of digital inputs: from $3,3V_{DC}$ to $36V_{DC}$.
Operative voltage of analogical inputs: from 0V to 10V (10 bit ADC).
Max current absorbed on each input: Digital: 10mA. Analogical: 0,1mA.
Input impedance: Digital: ≈2,5kΩ. Analogical: >1MΩ.
Logic low level: < 1V
Logic high level: > 2.5V
Protection: Digital: optocouplers with $2.500V_{RMS}$ maximum operative voltage.
Analogical: overvoltage protection through clamp diodes.
Connectors: pitch terminal block

Technical features of outputs:
Number of outputs: sixteen: 8 analogical and 8 digital
Operative voltage of digital outputs: from $3,3V_{DC}$ to $36V_{DC}$.
Operative voltage of analogical outputs: from 0V to 10V (10 bit DAC).
Max current on each output: Digital: 150mA. Analogical: ± 25mA.
Response average time: Digital: 100 µs. Analogical: 6ms (from 10% to 90% of the whole dynamic).
Protections Digital: optocouplers with $2.500V_{RMS}$ maximum operative voltage.
Connectors: pitch terminal block

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IN8-USB: ***Input Card with 8 inputs and USB interface***

IN8 is a low size auto powered control unit equipped with USB interface. IN8 can check eight galvanic isolated inputs: on each input it is possible to apply voltages regardless form the USB ground, with a maximum voltage of 30V.
Easy to use, thanks to the driver provided with and to the LabVIEW 8.2 library available on demand, IN8 also reduce installation costs.
The board low size to be easily integrated in several systems. Besides, IN8 has its inputs galvanically isolated to protect from electromagnetic disturbances and ground loops, improving its reliability and quality.
IN8 is the right answer to the need to acquire digital signals from a PC in an industrial environment.

General technical features:
Power supply: self-powered through USB
Working temperature: from 0°C up to + 60°C
Storage temperature: from -40°C up to + 85°C
Size: 80 x 75 mm (2,95 x 3,15 inches)

- Possibility to connect directly to an host port up to 256 cards, for a maximum of 2.048 inputs

USB port technical features:
1 type B port, compatible with USB 2.0, autonomously powered for the host connection

Technical features of inputs:
Number of inputs: 8
Operative voltage: from $3,3V_{DC}$ up to $36V_{DC}$
Max current absorbed: 10mA (on each input)
Input impedance: ≈ 2.5KΩ
Logic low level: < 1V
Logic high level: > 2.5V
Port read average time execution: 12 ms
Protection: optocouplers with $2.500V_{RMS}$ maximum operative voltage
Connectors: pitch terminal block

The state of the inputs is shown through LEDs on the board

LabVIEW Library for I/O cards:

A complete library for LabVIEW, giving the feasibility of I/O devices remote control, is available on request. The Library allows to implement a LabVIEW application without knowing the details of the communication protocol, making the development quick and easy.
Each library is provided with a help file which explains deeper each function included with.

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SUPPORT INFORMATION

The customer is at liberty to contact the relevant engineer at IPSES S.r.l. directly.

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		(+39) 02 320629547
Fax	:	(+39) 02 700403170
Email	:	support@ipses.com

PROBLEM REPORT

The next page is a standard template used for reporting system problems. It can be copied and send as a fax. Alternative bugs may be reported by emails, in this case please insure that the mail contains similar information listed in the *Engineering Problem Report* form.

ENGINEERING PROBLEM REPORT

Problem describer

Name			**IPSES s.r.l.** **Via Suor Lazzarotto, 10** **Cesate (MI)** **Italy** **Fax (+39) 02 700403170** **e-mail *support@ipses.com***
Company			
Date	Tel.	Fax	

Product

Name	Version	Serial No.

Report Type (bug, change request or technical problem)

Major bug	☐	Urgency:	
Minor bug	☐	High	☐
Change request	☐	Medium	☐
Technical problem	☐	Low	☐

Problem Description

Reproduction of Problem

IPSES s.r.l. Action notes

Received by	Date	Report No.	Action

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(Product code CAN I/O Rel. 01.00.0004)

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